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by laying down a dark field of ink, from which the light parts were then erased with a pen-knife. Upon a suggestion of Mr. Basire, the engraver, the same process has been copied on the lithographic stone: and the result is worth the attention of astronomers (as will appear in the Memoirs) in all cases in which the general features of a light upon a dark ground are required to be represented, at a less expense than that of copper-plate.

## III. Observations of the Solar Eclipse, May 15, 1836, by various Observers.

*Note.*—The letter *m* signifies mean solar time, and *s* sidereal time.

| Place. | | Time. | Observer. | Instrument. | Remarks. |
|---|---|---|---|---|---|
| | | h m s | | | |
| Aberdeen (Marischal College) | Begin. | 1 38 41, *m* | Dr. Cruickshank | 3½-feet achrom. | |
| | End | 4 22 58, *m* | — | — | " Certain to 1 sec." |
| Altona | Begin. | 2 43 50,8 *m* | Prof. Schumacher | | |
| | End | 5 21 23,2 *m* | — | | |
| Armagh (Observatory) | Begin. | 1 14 4,58 *m* | Dr. Robinson | Achr. 2¾ ap., pr. 60. | |
| | Ann. B. | 2 42 24,04 *m* | — | — | " Luminous cusps connected." |
| | Ann. E. | 2 42 45,98 *m* | — | — | " Luminous cusps disconnected." |
| | End | 4 4 58,88 *m* | — | — | " But the point of ultimate contact is a high mountain." |
| Ashurst (Mr. Snow's Ob.) | Begin. | 5 23 23,8 *s* | Mr. Snow | .............. | " Uncertain to 10 sec., but not more." |
| | End | 8 11 50,8 *s* | — | | |
| Bedford (Capt. Smyth's Ob.) | Begin. | 5 21 47,7 *s* | Capt. Smyth | 8½-ft. achr. pr. 110. | " Slight undulating impression." |
| | End | 8 10 10,8 *s* | — | — | " Certain to 1 sec." |
| Blackheath (Mr. Wrottesley's Observatory) | Begin. | 5 25 15,26 *s* | Mr. Wrottesley | | |
| | — | 5 24 59,44 *s* | Mr. Hartnup | | |
| | End | 8 12 57,05 *s* | Mr. Wrottesley | | |
| | — | 8 12 58,24 *s* | Mr. Hartnup | | |
| Cambridge (Observatory) | Begin. | 5 24 57,93 *s* | Mr. Airy | | |
| | End | 8 12 38,34 *s* | — | | |
| | — | 8 12 40,10 *s* | Professor Challis | | |
| Edinburgh (Observatory) | Begin. | 1 33 10, *m* | Mr. Galbraith | 49-in. achr., pr. 50. | |
| | Ann. B. | 2 57 20,9 *m* | Prof. Henderson | 51-in. achr., pr. 68. | |
| | Ann. E. | 3 1 3,3 *m* | | | |
| | End | 4 19 21,6 *m* | — | | " Doubtful 2 or 3 sec." |
| Falmouth | Begin. | 1 23 7, *m* | J. R. Andrews, R.N. | .............. | " Doubtful 1 or 2 sec." |
| | End | 4 15 57, *m* | — | | |
| Greenwich (Royal Observatory) | Begin. | ........ | .............. | .............. | " Lost by clouds." |
| | End | 8 12 53,83 *s* | Five Observers | | |
| | — | 8 12 54,33 | | | |
| | — | 8 12 57,65 | | .............. | " Every thing very favourable." |
| | — | 8 12 58,15 | | | |
| | — | 8 12 56,90 | | | |
| Greenwich (Royal Hospital) | Begin. | 1 51 28, *m* | Mr. Riddle | | |
| | End | 4 39 8, *m* | — | | |
| Greenwich (Royal Nav. Asyl.) | Begin. | 1 51 34, *m* | Rev. Mr. Fisher | 46-in. achr., pr. 70. | "Limbs exceedingly clear and well defined." |
| | End | 4 39 8, *m* | — | — | |
| Hampstead (Mr. Holford's) | Begin. | 5 23 47, *s* | Mr. Holford | 5-feet equatorial | |
| | End | 8 11 50, *s* | — | — | |
| Hartwell (Dr. Lee's Observ.) | Begin. | 5 19 45,5 *s* | Mr. Epps | 30-in. achr., pr. 60. | " First disturbance of sun's well-defined limb." |
| | End | 8 8 42,7 *s* | — | — | " Certain within 1 sec." |
| | — | 8 8 42,2 *s* | Dr. Lee | 5-feet achr., pr. 45. | |

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| Place. | | Time. | Observer. | Instrument. | Remarks. |
|---|---|---|---|---|---|
| | | h m s | | | |
| Inch-Bonney (near Jedburgh) | Begin. | 1 36 44, *m* | Mr. F. Baily | 3½-feet achrom. | |
| | Ann. B. | 3 0 57, *m* | | | |
| | Ann. E. | 3 5 23, *m* | | | |
| | End | 4 23 7, *m* | | | |
| Leyden (near the Observ.) | Begin. | 2 15 42,62 *m* | Dr. Kaiser | Aperture 38 lines. | |
| | End | 4 59 3,74 *m* | ——— | ——— | |
| Liverpool | End | 4 23 18,34 *m* | A. Livingston | 32-inch achrom. | |
| Markree | Begin. | 1 4 7,6 *m* | Mr. Cooper | 25-ft. achr., pr. 226. | |
| | ——— | 1 4 28,6 *m* | Mr. Slade | 3-feet achrom. | |
| | ——— | 1 4 54,6 *m* | Mr. Hemming | 3½-feet achrom. | |
| | End | 3 56 35,0 *m* | Mr. Cooper | .............. | "Evanescence of a raised part of the moon." |
| | — | 3 56 32,8 *m* | Mr. Slade | | |
| | — | 3 56 23,6 *m* | Mr. Hemming | | |
| Makerstoun | Begin. | 1 36 51,25 *m* | Sir T. Brisbane | .............. | "A little uncertain." |
| | Ann. B. | 3 1 4,21 *m* | ——— | | |
| | Ann. E. | 3 5 11,61 *m* | ——— | | |
| | End | 4 23 0,56 *m* | ——— | .............. | "Certain to 1 sec." |
| Ormesby (Lat. 52° 40′ 20″ N.) (Long. 6m 54s E.) | End | 4 45 46, *m* | Capt. Black, R.N. | Good common deck telescope. | |
| N. Shields (Lat. 55° 2′ 10″ N.) (Long. 1° 24m 0s W.) | Begin. | 1 43 16, *m* | Lieut. Hopkins, R.N. | 4½-feet achrom. | |
| | End | 4 28 55, *m* | ——— | ——— | |
| N. Yarmouth (Lat. 52° 36′ 13″ N.) (Long. 6m 58s E.) | Begin. | 2 0 45, *m* | Mr. A. Utting | 3-feet Greg., pr. 65. | "From a dusky appearance on sun's border." |
| | End | 4 46 10, *m* | ——— | ——— | "Uncertain to 5 sec., by a cloudy appearance on moon's border." |
| York (Observatory) | Begin. | 5 17 57,5 *s* | No. 1 | 3½-feet achrom. | |
| | ——— | 5 17 56,5 *s* | No. 2 | Achromatic. | |
| | ——— | 5 17 56,5 *s* | No. 3 | Reflector. | |
| | End | 8 5 20,5 *s* | No. 1 | | |
| | — | 8 5 21, *s* | No. 2 | | |
| | — | 8 5 21, *s* | No. 3 | | |

Mr. Baily gave a verbal account of a remarkable optical phenomenon observed by him at the late annular eclipse of the sun, consisting of several dark ligaments apparently connecting the borders of the sun and moon, at the commencement and dissolution of the annulus. A similar appearance was observed in the annular eclipse of 1820, by M. Van Swinden at Amsterdam; and is the only instance of the kind on record. Sir Thomas Brisbane and Mr. Henderson, who were present at the meeting, confirmed the statement made by Mr. Baily: and Mr. Baily promised to draw up a more detailed account, to be presented to the Society at their next session.

IV. Oppositions of *Jupiter* in January 1836, of *Juno* in January 1836, and of *Vesta* in March 1836, observed at Edinburgh. By Professor Henderson (continued from page 143).

*Jupiter*.—Mean correction of the *Naut. Alm.*, $-0^s,42$ in R.A and $-1''{\cdot}0$ in dec.; or $-4''{\cdot}6$ in helioc. long., and $-1''{\cdot}2$ in helioc. lat. at the time of the opposition: mean correctiou of the sun's R.A. $-0^s,04$.

Mean Greenwich time of opposition ........................ January, $1^d\ 16^h\ 2^m\ 32^s$
Helioc. long. of Jupiter, cleared of aberration, from mean equinox, $100^\circ\ 52'\ 11''{\cdot}3$
Helioc. lat. of Jupiter, cleared of aberration .......................... $+0\ \ 2\ \ 53\ {\cdot}9$

In the observations of the planets and the moon which have been already communicated, the declinations were obtained from comparison with the fundamental stars, adopting their mean de-

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clination as given by M. Bessel. The declinations are now obtained from a catalogue constructed from the observations made with the mural circle, which gives the declinations of stars betwixt the tropics on an average 0″·86 north of M. Bessel's places in the Berlin Jahrbuch, and 1″·97 south of the places in the Nautical Almanac. The right ascensions are still obtained from comparison with M. Bessel's mean places. The latitude of the observatory, by all the observations made with the mural circle, is 55° 57′ 23″·2 north.

*Juno.*—Mean correction of the *Naut. Alm.*, $+3^{s},15$ in R.A. and +19″·7 in dec.; or +25″·9 in helioc. long., and +13″·5 in helioc. lat. at the time of the opposition: mean correction of the sun's R.A. $-0^{s},04$.

| | |
|---|---|
| Mean Greenwich time of opposition | January, $1^{d}\ 1^{h}\ 3^{m}\ 43^{s}$ |
| Helioc. long. of Juno, cleared of aberration, from mean equinox, | 100° 14′ 1″·3 |
| Helioc. lat. of Juno, cleared of aberration | −12 19 19 ·1 |

*Vesta.*—Mean correction of the *Naut. Alm.*, $-2^{s},71$ in R.A. and +12″·3 in dec.; or −23″·7 in helioc. long., and −2″·8 in helioc. lat. at the time of the opposition: mean correction of the sun's R.A. $+0^{s},06$.

| | |
|---|---|
| Mean Greenwich time of opposition | March, $16^{d}\ 7^{h}\ 4^{m}\ 5^{s}$ |
| Helioc. long. of Vesta, cleared of aberration, from mean equinox, | 176° 15′ 38″·5 |
| Helioc. lat. of Vesta, cleared of aberration | +6 49 30 ·3 |

V. Occultations and eclipses of Jupiter's satellites, Edinburgh, September 1835 to April 1836. By Professor Henderson.

VI. Occultation observed at Ashurst, from January to July* 1836. By Mr. Snow.

VII. Meridian Observations of Halley's Comet, taken on the 10th and 11th of October, 1835, at Blackheath. By Mr. Wrottesley.

VIII. A List of Occultations, Breslau, February 1832 to March 1836. By Captain Boguslawski, Director of the Observatory.

M. Boguslawski offers to communicate any of these observations which may be desired of him. The longitude and latitude of the Observatory are $1^{h}\ 8^{m}\ 10^{s},2$ East, and 51° 6′ 56″ + North.

IX. Occultations in the month of May 1836, at Mr. Wrottesley's Observatory, Blackheath. Communicated by Mr. Wrottesley.

X. Moon-culminating Stars, observed at Hartwell in the year 1835. Communicated by Dr. Lee.

Mr. Riddle has deduced the longitude of Dr. Lee's observatory, by separate comparisons with Greenwich, Cambridge, and Edinburgh, and finds, from the mean of the whole, $3^{m}\ 19^{s},9$ W. of Greenwich.

XI. Example of a graphical method of finding the Longitude from an observed Occultation. By Captain Lloyd, R.N. Communicated by Sir J. Herschel.

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* These are here noticed, because they are to be found in Vol. IX. of the Memoirs up to the latter date.